

Medication Adherence and Physical Activity in Relation to Blood Pressure in Hypertension Patients

Gede Ari Mahendra Mardaningrat¹, Putu Dony Astika Wiguna¹, I Dewa Ayu Made Dian Lestari¹, Dewa Ayu Agung Maya Gayatri¹, Kadek Herdana Vildan Mardaningrat¹, Made Yogi Krisnanda²

¹Faculty of Medicine, Udayana University, Denpasar, Bali, Indonesia

²Seririt I Community Health Center, Buleleng, Bali, Indonesia

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Corresponding Author:

Gede Ari Mahendra

Mardaningrat

Faculty of Medicine, Udayana

University, Denpasar, Bali,

Indonesia

Email:

arimahendra28@gmail.com

ABSTRACT

In the 21st century, it is estimated that there will be a rapid increase in the incidence and prevalence of NCDs. It is estimated that the countries that will feel the impact the most are developing countries, including Indonesia. One of the NCDs that is currently a very serious health problem is hypertension. This study aims to determine the relationship between medication adherence and physical activity on blood pressure in hypertension patients. This research is an analytical study with a cross-sectional design. Data collection was carried out by conducting interviews with patients, filling out questionnaires by the patient, viewing the patient's medical record data and carrying out blood pressure checks in September 2023 to October 2023. Bivariate analysis showed that there was an influence of medication attendance (p value = 0.0001; PR = 7.667) and physical activity (p value = 0.0001; PR = 26.156) on blood pressure. Multivariate analysis showed that physical activity (p value = 0.0001; aPR = 23.726) had more influence on blood pressure than medication adherence (p value = 0.007; aPR = 6.622). It is important for health workers to always educate patients regarding medication compliance and increase physical activity in an effort to achieve normal blood pressure.

Keywords:

Adherence medication, Blood pressure, Hypertension, Physical activity.

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1. INTRODUCTION

In the 21st century, it is estimated that there will be a rapid increase in the incidence and prevalence of NCDs, which is a major health challenge in the future. In 2020, based on data World Health Organization (WHO), NCDs will cause 73% of deaths and 60% of all illnesses in the world. It is estimated that the countries that will feel the impact the most are developing countries, including Indonesia. One of the NCDs that is currently a very serious health problem is hypertension, which is known as the silent killer.^[1]

Hypertension is a cardiovascular disease that currently remains a health problem in the world, because it causes complications fatal. Hypertension is a condition where there is an increase in blood pressure above 130/90 mmHg which can result in increased morbidity and mortality in hypertension sufferers.^[2]

Based on data from the World Health Organization (WHO), the prevalence of hypertension in the world occurs in population aged > 18 years reaching 1 billion people, the number of sufferers Hypertension is predicted to continue to increase along with population which will increase by 2025, is estimated to be around 29% of the world's citizens affected by hypertension. The African region holds the peak position for hypertension sufferers, namely 40%. The Americas region is 35% and Southeast Asia 36%. In Asia, this disease kills 1.5 million people every year overall.^[3]

In 2013, the prevalence of hypertension in Indonesia nationally reached 25.8% of the Indonesian population. Currently the population of Indonesia has reached 252.124.458 people, which means there are 65.048.110 people suffering from hypertension.^[4] Bali is one of the provinces in Indonesia with a prevalence of hypertension sufferers with a percentage of 19.9%. The total population of Bali Province is around 4.225.384 people, with 840,851 people

experiencing hypertension. In Buleleng Regency, hypertension is ranked second in the top 10 non-communicable diseases that occur frequently in Buleleng Regency with a total of 17.939 cases.^[5]

There are several aspects that influence the quality of life of hypertension sufferers, one of which is compliance with treatment. Treatment compliance is patient compliance in taking medication regularly according to the prescription given by the doctor. If sufferers do not follow the doctor's advice in taking medication, their blood pressure can become uncontrolled, resulting in complications.^[6] Complications that can occur include stroke, myocardial infarction, kidney failure, and encephalopathy or brain damage. Factors that influence hypertension patients' compliance with hypertension treatment are the level of education, knowledge, family support and also the patient's level of motivation.^[7,8]

Lifestyle is an important aspect that influences the quality of life of hypertension sufferers, one of the most important aspects of lifestyle is physical activity. Physical activity is one factor that can influence blood pressure. Doing active physical activity regularly every day will be able to control blood pressure optimally in people with hypertension.^[9]

Research regarding the relationship between medication adherence and physical activity levels on blood pressure has not been widely studied at this time. Therefore, the aim of this study was to assess the relationship between medication adherence and physical activity in relation to blood pressure in hypertension patients.

2. METHOD

This research is an analytical study with a cross-sectional design. Data collection was carried out by conducting interviews with patients, filling out questionnaires by the patient, viewing the patient's medical record data and carrying out blood pressure checks. This research was conducted at the Seririt I Community Health Center from September to October 2023.

The population of this study were patients who had been diagnosed with hypertension and regularly visited the health center to collect medication at Seririt I Community Health Center. The research sample was selected using a total sampling method, where all hypertension patients who visited Seririt I Community Health Center during September 2023 to October 2023 were taken into account. sample. Therefore, the research sample used in this study was 70 people. The data was then collected and summarized using the Microsoft Excel application. The data that has been summarized is then analyzed using the SPSS Version 16 application for statistical tests.

3. RESULTS AND DISCUSSION

3.1. Result

Table 1 explains the characteristics of hypertension patients at Seririt I Community Health Center. Based on the research results, it was found that the majority of patients with hypertension were women, were 54.3%, while men were 45.7%. Judging from the age group, most hypertension patients are in the age range > 60 years, were 72.9%, then followed by the 40-60 years age group, were 25.7%, and the least are in the age range <40 years, were as much as 1.4%. Based on family history of hypertension, 40% have a family history of hypertension and 60% have no family history of hypertension. Based on the level of compliance in undergoing hypertension treatment, it can be said that hypertension patients at the Seririt I Community Health Center are still not compliant with treatment, with a compliance percentage of 57.1%. Based on the level of physical activity, they are still not active with the percentage of patients who are physically active at 55.7%. Based on the results of blood pressure examinations, 50% of hypertension patients at Seririt I Community Health Center had good blood pressure control, around 50% of hypertension patients had high blood pressure examination results.

Table 1. Characteristics of Hypertension patients at Seririt I Community Health Center

Characteristic	Total (n)	Percentage (%)
Gender		
Male	32	45.7
Female	38	54.3
Age		
<40 years old	1	1.4
40-60 years old	18	25.7
>60 t years old	51	72.9
Family History of Hypertension		
Yes	28	40
No	42	60
Medication Adherence		
Comply with Treatment	40	57.1
Failure to comply with treatment	30	42.9
Physical Activity		
Active	39	55.7
Not active	31	44.3
Blood Pressure		
Normal	35	50
High	35	50

Table 2 explains the relationship between medication adherence in hypertension patients and blood pressure. Based on table 2, the results showed that there were 28 patients with hypertension who were compliant with treatment and had normal blood pressure, then there were 12 patients with hypertension who were compliant with treatment but whose blood pressure was still high. There were 7 patients with hypertension who were non-compliant with treatment but whose blood pressure was normal. Meanwhile, there were 23 hypertension patients who were disobedient to treatment and whose blood pressure was still high. In table 2 a chi-square test has been carried out and a p value = 0.0001 is obtained with a significance of α 0.05. This states that there is a significant relationship between medication compliance and blood pressure in hypertension patients at the Seririt I Community Health Center

Table 2. Relationship between medication adherence and blood pressure

Variable	Blood Pressure		PR (95% CI)	p-value
	Normal	High		
Medication Adherence				
Comply with Treatment	28	12	7.667 (2.595-22.646)	0.0001
Failure to comply with treatment	7	23		

Table 3 explains the relationship between hypertension patients' physical activity and blood pressure. Based on table 3, the results showed that there were 31 patients with hypertension who were physically active and had normal blood pressure, then there were 8 patients with hypertension who were physically active but whose blood pressure was still high. There were 4 hypertension patients whose physical activity was less active but their blood pressure was normal. Meanwhile, there were 27 hypertension patients whose physical activity was less active and whose blood pressure was still high. In table 3 a chi-square test has been carried out and a p value = 0.0001 is obtained with a significance of α 0.05. This states that there is a significant relationship between physical activity and blood pressure in hypertension patients at the Seririt I Community Health Center

Table 3. Relationship between physical activity and blood pressure

Variable	Blood Pressure		PR (95% CI)	p-value
	Normal	High		
Physical Activity				
Active	31	8	26.156 (7.083-96.593)	0.0001
Less active	4	27		

Table 4 shows a multivariate analysis of the variables of medication adherence and physical activity on blood pressure. Based on table 4, it shows that physical activity (p value = 0.0001) has more influence than medication adherence (p value = 0.007) on blood sugar control.

Table 4. The relationship between medication adherence and physical activity on blood pressure

Variable	β	Sig	Adjusted PR	95% CI	
				Lower	Upper
Medication Adherence	1.890	0.007	6.622	1.658	26.455
Physical Activity	3.167	0.0001	23,726	5.752	97.867

3.2. Discussion

3.2.1. Relationship between medication adherence and blood pressure

The research results obtained data from 70 patients suffering from hypertension, 40 patients (57.1%) adhered to treatment, while 30 patients (42.9%) did not comply with treatment. The chi-square test results obtained a p value 0.0001, where $< \alpha$ (0.05), so it can be concluded there is a relationship between medication adherence and blood pressure. The results of data analysis obtained PR = 7.667. This means that hypertension sufferers who are not compliant with treatment will have a risk of experiencing an increase in blood pressure that is 7.6 times greater than those who are compliant with treatment.

When individuals with hypertension take their prescribed medications consistently and as directed, it helps maintain a steady level of the medication in their system.^[10] This consistent intake is crucial for managing blood pressure effectively. Hypertension medications work by relaxing blood vessels, reducing the force of blood flow, or decreasing the volume of blood in the circulatory system. These actions help lower and regulate blood pressure.^[11] To achieve and maintain a healthy blood pressure level, it is essential to consistently take the prescribed medications.^[12] Skipping doses or not taking the medication as directed can lead to fluctuations in blood pressure, which may result in inadequate control of hypertension.^[13] If individuals do not adhere to their medication regimen, their blood pressure may remain elevated, increasing the risk of complications such as heart disease, stroke, kidney problems, and more.^[14]

The relationship between medication adherence and blood pressure is that adherence to prescribed medications is a critical component of managing and controlling hypertension.^[15] By taking medications as directed, individuals can help maintain consistent blood pressure levels and reduce the risk of complications associated with high blood pressure.^[16,17]

3.2.2. Relationship between physical activity and blood pressure

The research results obtained data from 70 patients who had hypertension, 39 patients (55.7%) had active physical activity, while 31 patients (44.3%) had less active physical activity. The chi-square test results obtained a p value of 0.0001 where $< \alpha$ (0.05), so it can be concluded there is a relationship between physical activity and hypertension. The results of data analysis obtained PR = 26.15. This means that hypertension sufferers who do less physical activity will have a risk of experiencing an increase in blood pressure that is 26 times greater than hypertension sufferers who do active physical activity.

The results of the study showed that hypertension patients did not do much physical activity or moved more often, such as sweeping the house or cleaning the house and cleaning the yard both morning and evening. A number of patients admitted that after finishing eating they immediately sat down to watch TV or fell asleep. Then I rarely do sports and walking because I'm busy or my body is not very strong.

Aerobic exercise, such as brisk walking, jogging, swimming and cycling, has been proven by research to reduce systolic and diastolic blood pressure in people with hypertension. This reduction in blood pressure will be very beneficial for people with hypertension (high blood pressure).^[18] Regular physical activity can also help with weight loss. This is very important because being overweight is a risk factor for developing hypertension. Maintaining an ideal body weight will have an effect on reducing blood pressure.^[19] Apart from that, exercise can also improve endothelial function in the inner lining of blood vessels. This increase in function will lead to better dilation of blood vessels and reduce resistance to blood flow, so that ultimately there will be a decrease in blood pressure.^[20] Physical activity can reduce stress levels and increase relaxation. Lower stress levels will help lower blood pressure.^[21] Regular exercise improves cardiovascular fitness, increasing the heart's efficiency in pumping blood and oxygen. This can help reduce the workload on the heart so that it can lower blood pressure.^[22] Exercise will increase insulin work, so it will have a positive impact on reducing blood pressure.^[23] Regular physical activity can reduce the body's sensitivity to sodium, which is a factor that contributes to high blood pressure.^[24]

It is important to remember that the relationship between physical activity and blood pressure is not universal. Each person's response to exercise may be different, and it is important for people with hypertension to always consult a doctor before exercising, especially for people with hypertension or who are undergoing treatment for high blood pressure.^[25]

The American Heart Association (AHA) recommends doing a minimum of 3 times moderate aerobic physical activities per week and a minimum of 5 times vigorous intensity aerobic activities per week. Apart from that, activities are also carried out to strengthen muscles at least two days a week. In adults or the elderly with hypertension, it is very important to maintain heart and heart health. helps control blood pressure. However, specific exercise recommendations may vary based on individual health status and goals.^[26]

3.2.3. The relationship between medication adherence and physical activity on blood pressure

Based on a multivariate analysis carried out on medication adherence and physical activity on blood pressure. Multivariate analysis showed that physical activity (p value = 0.0001) had more influence on blood pressure than medication adherence (p value = 0.007). Then after carrying out the adjusted PR on physical activity, it was 23,726 and on medication compliance it was 6,622. This means that hypertension patients with less physical activity will have an effect on increasing blood pressure 23.7 times compared to hypertension patients who have active physical activity. In addition, patients who are not compliant with treatment will experience a 6.6 times increase in blood pressure compared to hypertension patients who are compliant with treatment

4. CONCLUSION

Hypertension is a cardiovascular disease that currently remains a health problem in the world, because it causes complications fatal. Hypertension is a condition where there is an increase in blood pressure above 130/90 mmHg which can result in increased morbidity and mortality. The majority of patients with hypertension in Seririt I Community Health Center was women 54.3%, age range > 60 years were 72.9%, no family history of hypertension were 60%, compliance with treatment were 57.1%, active physical activity were 55.7 and normal blood pressure same as high blood pressure were 50%. Based on the research results, it shows that medication compliance and physical activity have an influence on blood pressure. Statistical data shows that physical activity shows that physical activity has a greater influence on blood pressure than medication compliance. But both are still equally important. It is important for health workers to always educate patients regarding medication compliance and increase physical activity in an effort to achieve normal blood pressure in hypertension patients

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